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Lactarius annulocystidiatus sp. nov. from India

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Abstract — *Lactarius annulocystidiatus*, a new species of subgenus *Tristes*, is found associated with *Quercus leucotrichophora*. It is characterized by its granular pleurocystidia, with granulations clustered in annular rings around the cystidial tips. Macro- and microscopic features and data on ecological distribution are presented.

Key words — ectomycorrhizal, macrofungi, *Russulaceae*, taxonomy

Introduction

Lactarius Pers. is an agaricoid member of family *Russulaceae*, represented by 450 species worldwide (Kirk et al. 2008) and approximately 71 taxa from India (Atri et al. 1994, Natarajan et al. 2005, Das & Sharma 2005). The macroscopic and microscopic characters of a collection from Himachal Pradesh were compared with previously described species (Pearson 1950, Hesler & Smith 1979, Eberhardt & Verbeken 2004, Das et al. 2004, Das & Sharma 2005, Buyck et al. 2007, Le et al. 2007, Wang 2007, Stubbe et al. 2008, Montoya & Bandala 2008, Stubbe et al. 2010, Das & Verbeken 2011, 2012) and found to be sufficiently different to warrant description as a new species.

Material & methods

The macromorphology of the examined collection recorded on gross external morphology and micromorphology was studied in accordance to the methodology given by Atri et al. (2005). The terminology used for describing the color tone of the carpophore parts and spore print is after Kornerup and Wanscher (1978). Microscopic line drawings were made with the aid of a camera lucida at 1000×. Basidiospore measurement excludes the height of ornamentation and length of apiculus. Basidium length excludes the length of sterigmata. The spore shape quotient (Q=L/W) was calculated considering the mean value of length and width of 20 basidiospores. The holotype specimen has been deposited in the Herbarium of Botany Department (PUN), Punjabi University.

Taxonomy

Lactarius annulocystidiatus S. Sharma, M. Kaur & Atri **sp. nov.** Figs 1–6

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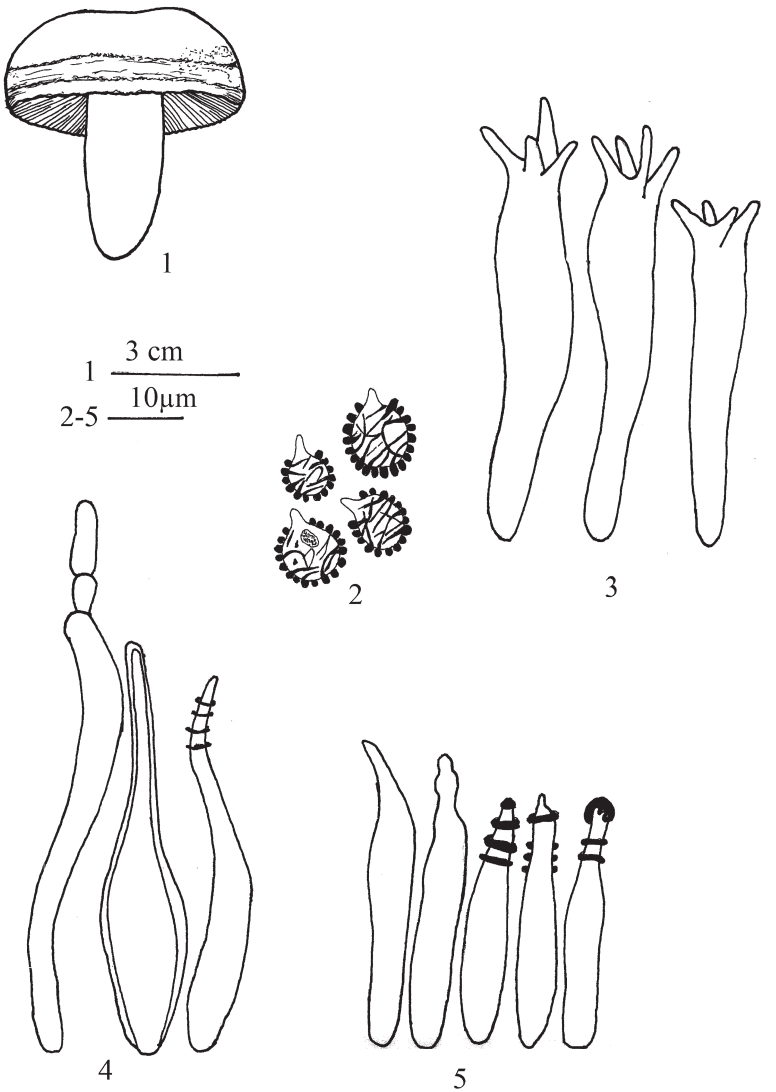
Differs from *Lactarius argillaceifolius* by its smaller basidiospores and smaller pleurocystidia with granulations in annular rings towards the tips.

Type: India, Himachal Pradesh: Andretta, solitary carpophore on humicolous soil in association with *Quercus leucotrichophora* A. Camus *(Fagaceae)*, 31 August 2009, Samidha 4314 (PUN, **holotype**)

Etymology: The species epithet is based on the presence of granulations in an annular pattern around the cystidial tips.

Fructification ≤ 6.5 cm in height. Pileus ≤ 6 cm broad, convex, feebly zoned concentrically around the periphery, shiny viscid; margin regular, unbearded; surface light yellow ($4A_4$), olivaceous to spotted pinkish to reddish brown; viscid; apex depressed; surface browning on bruising. Latex grayish milky, unchanging, mild; cuticle not peeling; flesh ≤ 0.2 cm broad, light yellow ($4A_4$), brownish on exposure, mild. Lamellae adnexed, unequal, crowded, light yellow ($4A_4$), brownish on bruising, narrow (0.3 cm broad), edges smooth, fragile. Taste mild, odour fruity. Stipe central, 4 cm long, 2 cm broad above and 1.2 cm broad below, tapering downwards, concolorous with the pileus, slimy viscid, brownish on bruising, hollow, smooth.

Basidiospores 5.7–8.6 × 5.7–7.2 µm, globose to broadly ellipsoidal (Q = 1.0–1.2), warty, warts ≤ 1.4 µm high, strongly amyloid, ornamentation in the form of coarse banded ridges forming incomplete reticulation and some warts isolated, at places 2–3 warts connected, ornamentation type I, IIIb, IV, VI (sensu Singer, 1986), plage amyloid and distinct, apiculate; apiculus ≤ 1.4 µm long. Basidia 40–50 × 5.7–8.6 µm, 4-spored, clavate, hyaline to densely granular, 6 basidia/100 µm, abundant, sterigmata 2.9–7.2 µm long. Pleurocystidia: macrocystidia 43–71.5 × 5.7– 11.4 µm, granular, thick walled, clavate, fusoid to ventricose in shape with moniliform, flame–shaped, capitate to mucronate or tubular pointed tips, granulated with granular contents aggregated in rings mostly towards the tips, which are prominently present around and near the gill edges; pseudocystidia 57.2–65.8 × 5.7–7.2 µm, vermiform, deeply seated, not projecting beyond basidia. Cheilocystidia 32.9–38.6 × 5.7–7.2 µm, similar in details to pleurocystidia. Hymenophoral trama hyphal, irregularly arranged, subhymenium indistinct. Pileus cuticle 150–200 µm thick, partially gelatinized, made up of horizontally running, branched closely septate 4.3– 5.7 µm broad hyphae, some ampulliform, some H-shaped with rectangular cells; pilear trama made up of rosettes of sphaerocysts intermingled with ≤ 5.7 µm broad hyphae and laticifers. Stipe cuticle gelatinized, made up of longitudinally running ≤4.3–7.2 µm broad hyphae; stipe trama made up of rosettes of sphaerocysts intermingled with ≤ 5.7 µm broad hyphae. Laticifers present throughout the context of carpophores. Clamp connection absent.



Figs 1–5. *Lactarius annulocystidiata*: microscopic structures.
1. Carpophore; 2. basidiospores; 3. basidia; 4. pleurocystidia; 5. cheilocystidia

Remarks— *Lactarius annulocystidiatus* is characterized by its viscid, light yellow pileus surface with pinkish to reddish brown tinge, unbearded margins, grayish milky mild unchanging latex in young fruit body and all parts of the

Fig. 6. *Lactarius annulocystidiata* in situ.

fungus becoming brownish on bruising. These features are typical of subgenus *Tristes,* section *Pseudomyxacium*, stirps *Argillaceifolius* (sensu Hesler & Smith, 1979). It seems to be a close relative of *L. argillaceifolius* Hesler & A.H. Sm. var. *argillaceifolius,* which can be separated in the field by its pubescent margin and decurrent closely placed lamellae. Microscopically, the basidiospores of *L. argillaceifolius* var. *argillaceifolius* are larger [(7–)8–10(–11) × 7–8 µm], the pleurocystidia and cheilocystidia, which are larger and clavate, lack granulations around the tips, and the pileus surface lacks ampulliform, H-shaped branched hyphae.

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